Patent Claims

1. A method for cleaning teeth by means of an electric dental cleaning device (1, 2) having coupled to its handle section (1) various cleaning tools (2) for the individual tooth cleaning of the users of the dental cleaning device, characterized by the steps of detecting or recognizing a coding provided on the respective cleaning tool (2) used by means of the handle section (1) and controlling, in dependence upon the respective coding detected or recognized, dental cleaning parameters by means of the handle section (1) and/or detecting, receiving or storing user-specific dental cleaning data.

2. The method as claimed in the preceding claim, comprising the step of adapting operating parameters of the dental cleaning device (1, 2), in particular cleaning frequency, cleaning speed, cleaning time and/or application pressure or threshold value or desired range of application pressure in dependence upon the detected coding.

3. The method as claimed in any one of the preceding claims, comprising the steps of detecting, storing, processing and/or indicating cleaning frequency, cleaning speed, cleaning time and/or application pressure as user-specific tooth cleaning data.

4. A handle section (1) of an electric dental cleaning device (1, 2), with a coupling section for the coupling of cleaning tools (2), in particular brush attachments, and with a drive mechanism (23) for driving the respective coupled cleaning tool, characterized in that provision is made for a coding detection device (5) for detecting a preferably individual coding of the respective cleaning tool (2) attached to the handle section and a control device (27) for the control of at least one function of the dental cleaning device in dependence upon the detected coding.

5. The handle section as claimed in claim 4 wherein the control device (27) includes control elements for the control of operating parameters of the dental cleaning device, in particular cleaning frequency, cleaning speed, cleaning time and/or application pressure or threshold value or desired range of application pressure in dependence upon the detected coding.

6. The handle section as claimed in any one of the preceding claims 4 to 5 wherein provision is made for a data device for the detection, storage, processing and/or indication of dental cleaning data, and the control device possesses control elements for controlling the data device in dependence upon the detected coding.

7. The handle section as claimed in any one of the preceding claims 4 to 6 wherein the coding detection device (5) is of the noncontacting type.

8. The handle section as claimed in any one of the claims 4 to 6 wherein the coding detection device (5) is actuatable mechanically.

9. The handle section as claimed in any one of the preceding claims 4 to 8 wherein the coding detection device (5) includes at least one movable and/or elastically deformable contact (17) or similar sensing element that is adapted to be moved and/or deformed by a coding of a cleaning tool (2) and produces a signal corresponding to its movement and/or deformation.

10. The handle section as claimed in claim 9 wherein the contact (17) or sensing element is constructed as an electrical contact member.

11. The handle section as claimed in any one of the preceding claims 4 to 10 wherein a probe element is movably, preferably displaceably, mounted and has an engagement surface (56) for engagement with a corresponding actuating surface (55) of a cleaning tool (2).

12. The handle section as claimed in claim 11, characterized in that the engagement surface mates with the actuating surface of the cleaning tool (2) such that on coupling engagement of the cleaning tool (2) with the handle section the probe element is moved by an amount predetermined by the actuating surface.

13. The handle section as claimed in claim 11 or 12, characterized in that the coding detection device (5) includes a motion sensor (17; 57) for detecting the movement of the probe element.

14. The handle section as claimed in any one of the preceding claims 11 to 13 wherein the probe element is formed by a drive shaft (28) mounted preferably in longitudinally displaceable fashion.

15. The handle section as claimed in any one of the preceding claims 13 or 14 wherein the motion sensor is a sensing element (57) according to claim 9 or 10.

16. The handle section as claimed in any one of the preceding claims 4 to 15 wherein the coding detection device (5) includes a signal receiver (20) for receiving a coded signal from the cleaning tool (2) and/or a signal transmitter (20) for transmitting a signal, particularly an interrogation or activation signal, to the coupled cleaning tool (2).

17. The handle section as claimed in any one of the preceding claims 4 to 16 wherein the coding detection device (5) includes an optical sensor (12; 13; 15) for detecting an optical coding (7) of the respective cleaning tool (2) attached.

18. The handle section as claimed in any one of the preceding claims 4 to 17 wherein the coding detection device (5) includes a magnetic sensor (6; 9; 10) for detecting a magnetic coding (7) of the respective cleaning tool (2) attached.

19. The handle section as claimed in any one of the preceding claims 4 to 18 wherein the coding detection device (5) includes a sensor (9), in particular an LC oscillator, for detecting a metallic and/or magnetic coding (7) of the respective cleaning tool (2) attached.

20. The handle section as claimed in any one of the preceding claims 4 to 19 wherein the coding detection device (5) includes a capacitive sensor (21) for detecting a capacitive coding (7) of the respective cleaning tool (2) attached.

21. The handle section as claimed in any one of the preceding claims 4 to 20 wherein the coding detection device (5) includes an electrical or electromagnetic sensor for detecting an electrical or electromagnetic coding of the respective cleaning tool (2) attached.

22. The handle section as claimed in any one of the preceding claims wherein provision is made for an activation switch for activating the coding detection device, said activation switch being formed preferably by a switch for starting the handle section.

23. The handle section as claimed in claim 22, characterized in that on turning on the activation switch first the coding detection device and then, upon detection of the cleaning tool (2), the handle section is started.

24. The handle section as claimed in any one of the preceding claims 4 to 23 wherein the coding detection device (5) is arranged in a closed, in particular fluid-tight handle housing (26).

25. A cleaning tool, in particular a brush attachment, with a coupling section to effect coupling to a handle section (1) preferably according to any one of the preceding claims 4 to 24, characterized by a magnetic, electrical, capacitive, electromagnetic and/or mechanical coding device (7).

26. The cleaning tool as claimed in claim 25 wherein the coding device includes a signal receiver (19; 14) for receiving a signal from the handle section (1) and a signal transmitter (19; 14) for transmitting a coded signal to the handle section (1), in particular a smart transponder chip (19).

27. The cleaning tool as claimed in claim 25 or 26 wherein coding elements are provided between the signal receiver (44) and the signal transmitter (44) for coding the received signal.

28. The cleaning tool as claimed in any one of the preceding claims 25 to 27 wherein the coding device possesses a coding body, particularly a shaped body, which is fixedly connected to the body of the cleaning tool and preferably arranged and configured so as to be positioned in the range of detection of a coding detection device (5) of the handle section (1) when the cleaning tool (2) and the handle section (1) are in coupled condition.

29. The cleaning tool as claimed in any one of the preceding claims 25 to 28 wherein provision is made for at least one actuating section as mechanical coding device,

which on coupling of the cleaning tool (2) to the handle section (1) actuates a probe element or a sensing element (17; 57) on the handle section (1), particularly by moving and/or deforming it by a predetermined degree and/or in a predetermined direction and/or exerting a predetermined force thereon.

30. The cleaning tool as claimed in claim 29 wherein as actuating section an actuating surface (55) is provided, in particular a pressure application surface, which registers with a corresponding engagement surface (56) associated with the probe element or sensing element (17, 57) of the handle section (1) in such manner that on coupling of the cleaning tool (2) to the handle section (1) the engagement surface (56) on the handle section is moved by a predetermined amount and/or in a predetermined direction and/or is acted upon by a predetermined force.

31. The cleaning tool as claimed in any one of the preceding claims 25 to 30 wherein the mechanical coding device is configured in such manner as to cooperate with a drive shaft (28) of the handle section (1), being preferably a section of a drive shaft of the cleaning tool.

32. The cleaning tool as claimed in any one of the preceding claims 25 to 31 wherein the mechanical coding device includes at least one magnetic coding body (8) which is arranged preferably in the area of a coupling end of the cleaning tool.

33. The cleaning tool as claimed in any one of the preceding claims 25 to 32 wherein the coding device includes at least one dielectric coding body (8) which is arranged preferably in the area of a coupling end of the cleaning tool, being constructed to protrude beyond the end in particular in the direction of the coupling motion.

34. The cleaning tool as claimed in any one of the preceding claims 25 to 33 wherein the coding device includes an optical waveguide (37) communicating with a light entrance opening (38) and a light exit opening (39) provided preferably in the coupling end of the body of the cleaning tool.

35. The cleaning tool as claimed in any one of the preceding claims 25 to 34 wherein the coding device (7)is an integral part of the body of the cleaning tool.

36. The cleaning tool as claimed in any one of the preceding claims 25 to 34 wherein the coding device (7) is connected to the body of the cleaning tool preferably releasably.

37. The cleaning tool as claimed in any one of the preceding claims 25 to 36 wherein the coding device is integrated in a ring (8) arranged at a coupling end of the cleaning tool, being preferably snap-fittable to the body of the cleaning tool by positive engagement therewith.

38. An electric dental cleaning device, in particular toothbrush, comprising a handle section (1) in particular with a cleaning tool (2) adapted to be coupled thereto, each according to any one of the preceding claims 4 to 37.